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ABSTRACT

This presentation uses data from a long-term juvenile diversion counseling program to illustrate a sample method of estimating program cost. Several problems in using average cost figures are first presented. Then a method is described in which discriminant analysis can be used to refine cost comparisons. This makes it possible to produce meaningful comparisons between programs which differ substantially overall, but serve a somewhat overlapping clientele. Problems inherent in the discriminant analysis method are also mentioned. (Author/BP)

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PSYCHOMETRICS FOR THE COST CONSCIOUS: USING DISCRIMINANT ANALYSIS TO REFINE ESTIMATES OF PROGRAM COST

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Despite the difficulty of attaching dollar values to changes in individual or group behavior patterns, cost effectiveness is often the theme of most concern to local politicians responsible for funding social programs. Unfortunately current economic theory provides little guidance on how the costs or benefits of such programs should be measured, with the result that inappropriate comparisons between rather different program alternatives are often used to estimate cost effectiveness. In practice this often means taking overall total expenditures as the measure of cost, while citing whatever evidence of change is available as the measure of benefits. When figures are available, average costs per client or per service session are used to provide more intelligible figures, but again they are based on overall average costs.

In this segment of our presentation, I would like to review several problems we have had in using average cost figures and describe a way in which the discriminant analysis previously presented can be used to refine cost comparisons, making it possible to produce meaningful comparisons between programs which, overall, differ substantially, but which do serve a somewhat overlapping clientele.

Relationship of Program Organization to Cost

Variation in Programs. Several major differences in program structure are represented in the several projects we have evaluated over the last several years. Those differences can be represented along a dimension anchored on one end by projects which act simply as brokers--directing clients and funds to

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to appropriate referrals, monitoring their progress and maintaining liasons with various community groups involved with juveniles and the diversion effort, and on the other end by those projects which provide a wide variety of direct services, from family and individual counseling to shelter care and recreational programs. Not surprisingly, the costs associated with providing service vary depending on the range of services provided; with the broker type projects generally providing "cheaper" service than those offering a wider range of direct services.

Were we to conclude the analysis with comparisons of overall average costs, it seems clear that the broker model would be preferable to a direct service model in every case. However, that analysis ignores differences in availability of resources, differences in clients, and the preferences of local communities. Thus we have attempted to refine our cost analysis in a way which will provide meaningful comparisons of cost while not prejudicing the question of which type of provider model should be adopted by the individual projects.

In this case, as is always true when working in non-laboratory situations, the key to a meaningful comparison is finding a program similar to the program being evaluated. The range of differences described earlier makes it difficult to use direct comparisons between entire projects, or between the projects and any of several other juvenile agencies, for example probation, whose services overlap but do not duplicate those of the projects.

However, those program differences can be partially eliminated by separating overhead costs from costs of providing direct services. While overhead clearly cannot be ignored in the overall evaluation, removing it from the cost figure tends to equate organizations which have radically different missions and overhead, allowing a fairer comparison of the cost of providing those services which the projects do provide in common. In this evaluation, overhead was removed to allow

comparisons between projects providing only counseling services with those providing a wider range of direct service, as well as with probation. By removing the cost of those "unique" services and focusing on comparisons of services offered in common project performance, hopefully, can be evaluated separate from the model or overall package of services provided. Thus, after reviewing the cost analysis, a community might decide that, while it is getting its individual services at a rate which is comparable to charges elsewhere, it cannot afford the overall package of services provided, or vice versa.

Use of the Discriminant Analysis

Programs used to establish comparison levels differ not only in the range of services provided, but perhaps more importantly, in the range of clients served. Direct service providers frequently object, and rightly so, that average cost figures do not do justice to the differences in clients that exist between projects. Clearly, programs which deal with severely disturbed or chronic offenders cannot be compared fairly with projects whose clients require less intensive service. However, it is not uncommon for that distinction to be lost in the cost-effectiveness analyses.

In attempting to take differences in client populations into account one is faced again with the difficulty of finding or creating a suitable comparison group. In a pilot project currently underway we are using the discriminant analysis to identify groups of clients who appear to have similar presenting problems, at least as viewed by the policemen referring them, but who are given different dispositions. The analysis has focused on attempting to match cases which went to one of several diversion programs with similar cases which were referred to probation.

The matched cases are then tracked individually through the respective systems and compared on the basis of amount of service provided as well as the cost of providing that service. The resulting cost figures hopefully will provide a more precise breakdown of the cost of providing a given amount of service to a particular type of client in each of the systems studied. The approach should facilitate comparisons between systems which are substantially different yet do overlap to some degree, and thus should permit comparisons not only between probation and the diversion projects in general, but also between diversion projects which differ in structure or client population.

Problems with the Analysis

Who should provide the judgement of similarity? Perhaps the most serious conceptual issue involved in this analysis is that of deciding who in the system should provide the judgement of case similarity. So far we have relied on data provided by the referring police officer, since that is the person who currently makes the disposition decision. However, pilot data which compares judgements of diversion counselors with those of the referring officer suggests that substantial differences in ratings of severity might be found, resulting in rather different judgements of case similarity. Obviously, that difference might radically alter the results of the cost analysis.

Discriminant score vs. matching by variable. A second, perhaps more technical problem with the analysis arises after the rater has scored each case and the discriminant function has been generated. What emerges from that analysis is a function which gives the evaluator the choice of matching cases based on the summary discriminant score, or item by item on the variables which best discriminated between the groups in the analysis.

As a practical matter matching variable by variable seems to restrict the number of variables that can be considered in making the match,since the number of matches rapidly approaches zero as more and more variables are considered. However, since various combinations of scores on individual variables can combine to produce similar overall discriminant scores, matches based solely on the discriminant scores seem somewhat ill-defined.